CLAIMS

1. A method for encoding video data, comprising the steps of:

   dividing (S10) an image into blocks, each block including a plurality of pixels,

   transforming (S20) the pixels of a block into transform coefficients, and

   quantizing the coefficients in accordance with predefined quantization intervals by mapping each coefficient value to a quantized coefficient value

   characterized in that

   the quantization intervals are set in accordance with a predefined quantization curve, said quantization curve being a non-linear curve having smaller quantization intervals for lower coefficient values.

2. A method according to claim 1, wherein the step size of the quantization intervals of said predefined quantization curve increases for larger coefficient values.

3. A method according to claim 1, wherein said quantization intervals increase in accordance with a piecewise linear curve, a root curve or a logarithmic curve for increasing coefficient values.

4. A method according to any of claims 1 to 3, wherein said predefined quantization curve being defined by parameters (315), and said quantized coefficient values together with said predefined parameters (315) represent the encoded video data.

5. A method according to any of claims 1 to 4, wherein said quantizing step comprises the steps of:

weighting (S30) said coefficient values in accordance with said predefined quantization curve, and

quantizing (S40) said weighted coefficient values by applying fixed quantization intervals.

6. A method according to claim 5, wherein said fixed quantization intervals being quantization intervals of a regular interval size.

7. A method according to claim 5 or 6, wherein said quantization curve being a piecewise linear curve, a root curve or a logarithmic curve.

8. A method according to any of claims 1 to 7, wherein said method further comprises the steps of:

detecting a degree or the presence of film grain within the video data to be encoded, and

adjusting the parameters (315) of said predefined quantization curve in accordance with the detection result.

9. A method according to any of claims 1 to 7, wherein said method further comprises the steps of:

detecting the presence of film grain within the video data to be encoded, and

enabling the application of said quantization curve only if film grain has been detected.

10. A method according to any of claims 1 to 9, wherein said method further comprises the step of predicting the block to be encoded based on a previously encoded block wherein said prediction step comprises a decoding step including a de-quantization step which applies said predefined quantization curve in inverse manner to said encoded coefficients.

11. An encoder for encoding video data based on image blocks, each block including a plurality of pixels, comprising:

a transform unit (120) for transforming the pixels of a block into transform coefficients, and

a quantizer (120) for quantizing the transform coefficients in accordance with predefined quantization intervals by mapping each coefficient value to a quantized coefficient value

characterized in that

the quantization intervals are set in accordance with a predefined quantization curve, said quantization curve being a non-linear curve having smaller quantization intervals for lower coefficient values.

12. An encoder according to claim 11, wherein the quantization intervals of said predefined quantization curve having a step size which increases for larger coefficient values.

13. An encoder according to claim 11, wherein said quantization intervals increase in accordance with a piecewise linear curve, a root curve or a logarithmic curve for increasing coefficient values.

14. An encoder according to any of claims 11 to 13, wherein said predefined quantization curve being defined by parameters (315), and said quantized coefficient values together with said predefined parameters (315) represent the encoded video data.

15. An encoder according to any of claims 11 to 14, wherein said quantizer comprises:

weighting means (410) for weighting said coefficient values (W) in accordance with said predefined characteristic curve, and

core quantization means (120) for quantizing said weighted coefficient values (V) by applying fixed quantization intervals.

16. An encoder according to claim 15, wherein said fixed quantization intervals being quantization intervals of a regular interval size.

17. An encoder according to claim 15 or 16, wherein said characteristic curve being a piecewise linear curve, a root curve or a logarithmic curve.

18. An encoder according to any of claims 11 to 17, further comprising:

a detector for detecting a degree or the presence of film grain within the video data to be encoded, and

setting means for adjusting the parameters (315) of said predefined quantization curve in accordance with the detection result.

19. An encoder according to any of claims 11 to 17, further comprising:

a detector for detecting the presence of film grain within the video data to be encoded, and

enabling means for enabling the application of said quantization curve only if film grain has been detected.

20. An encoder according to any of claims 11 to 19, wherein said encoder being a predictive encoder and further comprises a decoder for decoding the encoded video data, said decoder including a de-quantizer applying said predefined quantization curve in inverse manner.

21. A method for decoding encoded video data on a block basis, said encoded video data include quantized coefficients, comprising the steps of:

de-quantizing (S50) a block of quantized coefficients of said encoded video data by mapping each quantized coefficient value to a de-quantized coefficient value in accordance with predefined quantization intervals, and

transforming (S70) a block of de-quantized coefficients into a block of pixels

characterized in that

the quantization intervals are set in accordance with a predefined quantization curve, said quantization curve being a non-linear curve having smaller quantization intervals for lower coefficient values.

22. A method according to claim 21, wherein the quantization intervals of said predefined quantization curve having a step size which increases for larger coefficient values.

23. A method according to claim 21, wherein said quantization intervals increase in accordance with a piecewise linear curve, a root curve or a logarithmic curve for increasing coefficient values.

24. A method according to any of claims 21 to 23, wherein said predefined quantization curve being defined by parameters (315), and said quantized coefficient values together with said predefined parameters (315) represent said encoded video data.

25. A method according to claim 24, wherein said parameters (315) define the quantization curve applied to said quantized coefficient values during encoding.

26. A method according to any of claims 21 to 25, wherein said de-quantizing step comprises the steps of:

de-quantizing (S50) said quantized coefficients (Z) by applying an inverse quantization having fixed quantization intervals, and

weighting (S60) said de-quantized coefficient values (V') in accordance with said predefined quantization curve.

27. A method according to claim 26, wherein said fixed quantization intervals being quantization intervals of a regular interval size.

28. A method according to claim 26 or 27, wherein said quantization curve being a piecewise linear curve, a root curve or a logarithmic curve.

29. A decoder for decoding encoded video data on a block basis, said encoded video data include quantized coefficients, comprising:

an inverse quantizer (220) for de-quantizing a block of quantized coefficients of said encoded video data by mapping each quantized coefficient value to a de-quantized coefficient value in accordance with predefined quantization intervals, and

an inverse transformer (220) for transforming a block of de-quantized coefficients into a block of pixels

characterized in that

the quantization intervals are set in accordance with a predefined quantization curve, said quantization curve being a non-linear curve having smaller quantization intervals for lower coefficient values.

30. A decoder according to claim 29, wherein the quantization intervals of said predefined quantization curve having a step size which increases for larger coefficient values.

31. A decoder according to claim 29, wherein said quantization intervals increase in accordance with a piecewise linear curve, a root curve or a logarithmic curve for increasing coefficient values.

32. A decoder according to any of claims 29 to 31, wherein said predefined quantization curve being defined by parameters (315), and said quantized

coefficient values together with said predefined parameters (315) represent the encoded video data.

33. A decoder according to claim 32, wherein said parameters (315) define the quantization curve applied to said quantized coefficient values during encoding.

34. A decoder according to any of claims 29 to 33, wherein said inverse quantizer comprises:

core de-quantizing means (326) for de-quantizing said quantized coefficients (Z) by applying an inverse quantization having fixed quantization intervals, and

weighting means (330) for weighting said de-quantized coefficient values (V') in accordance with said predefined quantization curve.

35. A decoder according to claim 34, wherein said fixed quantization intervals being quantization intervals of a regular interval size.

36. A decoder according to claim 34 or 35, wherein said quantization curve being a piecewise linear curve, a root curve or a logarithmic curve.